

Serial No.: 10/089,072
Atty. Docket No.: P67777US0

IN THE CLAIMS:

Please amend/retain the claims as follows:

Claims 1-7 (Canceled).

8. (Previously Presented) A torque-limiting coupling device comprising:

a shaft having a surface layer thereon;

an outer sleeve frictionally engaging said for transmission of torque up to a preset limit, said outer sleeve rotating relative to said shaft when said torque exceeds said preset limit; and

a pump mechanism, responsive to said outer sleeve rotating relative to said shaft, for pumping liquid to an interface between said surface layer and an inner surface of said outer sleeve;

said surface layer having a plasticizing limit which is lower than a plasticizing limit of said outer sleeve inner surface.

9. (Previously Presented) The torque-limiting coupling device as set forth in claim 8, wherein said surface layer is made of a tin-copper alloy.

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10. (Previously Presented) The torque-limiting coupling device as set forth in claim 9, wherein said surface layer has a thickness of about 5 mm.

11. (Previously Presented) The torque-limiting coupling device as set forth in claim 9, wherein said alloy has an elastic limit of about 100 N/m².

12. (Previously Presented) The torque-limiting coupling device as set forth in claim 11, wherein said surface layer has a thickness of about 5 mm.

13. (Previously Presented) The torque-limiting coupling device as set forth in claim 8, wherein said surface layer further includes cavities on an outer surface thereof which enable said surface layer, upon plasticization thereof, to disengage from said inner surface of said outer sleeve.

14. (Previously Presented) The torque-limiting coupling device as set forth in claim 13, wherein said cavities include grooves disposed around a circumference of said surface layer.

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15. (Previously Presented) The torque-limiting coupling device as set forth in claim 8, wherein said surface layer is made of tombak and said inner surface of said outer sleeve is made of steel.

16. (Previously Presented) The torque-limiting coupling device as set forth in claim 8, wherein said surface layer further includes cavities on an outer surface thereof which are dimensioned such that said surface layer, upon plasticization thereof, has a radial thickness that is smaller than a radial distance between said shaft and said inner surface of said outer sleeve when said shaft and said outer sleeve have been radially relieved of load.

17. (Previously Presented) The torque-limiting coupling device as set forth in claim 16, wherein said cavities include grooves disposed around a circumference of said surface layer.

18. (Previously Presented) The torque-limiting coupling device as set forth in claim 8, wherein said surface layer is removable from said shaft for replacement thereof following plasticization.

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19. (Currently Amended) A torque-limiting coupling device comprising:

a generally cylindrical shaft having a removable outer surface layer thereon, said outer surface layer having a first plasticizing limit;

a sleeve having a generally cylindrical inner surface which coacts with said outer surface layer, said inner surface having a second plasticizing limit higher than said first plasticizing limit, said sleeve inner surface being in frictional engagement with said shaft through said outer surface layer for transmission of torque up to a preset limit, said sleeve rotating relative to said shaft when said torque exceeds said preset limit; and

a pump mechanism, responsive to said sleeve rotating relative to said shaft, for pumping liquid to an interface between said outer surface layer and said inner surface to reduce friction therebetween;

said outer surface layer, in the event of insufficient liquid at said interface, undergoing plasticization due to said relative rotation between said sleeve and said shaft, said plasticization allowing to allow said sleeve to rotate free from contact with said shaft to limit damage to said sleeve and/or shaft

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~~in the event said pump mechanism pumps insufficient liquid to said interface.~~

20. (Previously Presented) The torque-limiting coupling device as set forth in claim 19, wherein said outer surface layer is made of a tin-copper alloy.

21. (Previously Presented) The torque-limiting coupling device as set forth in claim 20, wherein said outer surface layer has a thickness of about 5 mm.

22. (Previously Presented) The torque-limiting coupling device as set forth in claim 20, wherein said alloy has an elastic limit of about 100 N/m².

23. (Previously Presented) The torque-limiting coupling device as set forth in claim 19, wherein said outer surface layer further includes cavities therein which enable said outer surface layer, upon plasticization thereof, to disengage from said inner surface of said outer sleeve.

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24. (Previously Presented) The torque-limiting coupling device as set forth in claim 23, wherein said cavities include grooves disposed around a circumference of said outer surface layer.

25. (Previously Presented) The torque-limiting coupling device as set forth in claim 19, wherein said outer surface layer is made of tombak and said inner surface of said outer sleeve is made of steel.

26. (Previously Presented) The torque-limiting coupling device as set forth in claim 19, wherein said outer surface layer further includes cavities therein which are dimensioned such that said outer surface layer, upon plasticization thereof, has a radial thickness that is smaller than a radial distance between said shaft and said inner surface of said outer sleeve when said shaft and said outer sleeve have been radially relieved of load.

27. (Previously Presented) The torque-limiting coupling device as set forth in claim 26, wherein said cavities include grooves disposed around a circumference of said outer surface layer.